5. *Uses of the Pancreas.*—Dr. Frerichs has lately investigated the uses of the pancreas which differ materially from those of Bernard noticed in our number for January, 1849, p. 160. The experiments of the former have led him to the following conclusions:

1. That *one* function of the pancreatic juice is, to convert amylaceous matter into sugar during the process of assimilation.

2. That the pancreatic juice converts the bile into an insoluble compound and thus favours its expulsion from the system, while it prevents its resorption.

3. That a third use of the pancreatic secretion is, in conjunction with the bile, to effect the fine division of the neutral fatty matters, essential to their absorption into the lacteal system.—*Monthly Journ.*, from Wagner's *Handwörterbuch der Physiologie.*

ORGANIC CHEMISTRY.

6. *Experiments on the Use of Salt.*—M. Plouviez recently presented a memoir to the Academy of Medicine, detailing the results of a series of experiments he has been engaged upon, with the view of determining the part which salt plays in alimentation. To insure accuracy, he had to make choice of persons who led regular lives, continued their habitual mode of alimentation, took the salt at a meal it is not usually taken at, viz. in the morning (with milk), and were weighed before, after, and during the intervals of the experiments. He found more than 25 persons who fulfilled these conditions; but he does not detail the experiments made upon these, as the results only differed in some shades from those observed upon himself. Some of the persons experimented upon, increased in weight from 500 to 2500 grammes in 30 days, and that only from the daily use of from 6 to 10 grammes of salt. Others increased from 5000 to 10,000 grammes in three or four months. Some acquired more strength and vigour, without any of the inconveniences of excess of nutrition, while others suffered from all the inconveniences of plethora, until the regimen was changed. The nutritive power of the salt was always most observable in feeble, lymphatic subjects. The experiments would at first seem to support the opinion of those who state that 1 lb. of salt will produce 10 lbs. of flesh; but if the regimen is continued from 5 to 10 months or more, the progressive increase of weight is no longer observed, a stationary condition ensuing, the blood being now as rich and nutrition as complete as possible. This fact explains the opposite conclusions arrived at by different observers. The appetite is sometimes found to increase during the first 8 or 10 days, then to resume its normal condition, and after the first or second month to diminish. The most general and certain effect is the increase of the strength; heat is more readily generated, and the exposure to cold better borne.

M. Plouviez's experiments upon himself were commenced in May, 1842, when he weighed 75 kilogrammes. Beginning with a teaspoonful, he increased it to a tablespoonful (from 4 to 6 grammes), and continued this daily for 4 months. By the end of June his strength and weight (80 kilogrammes), had both augmented. By the end of July he found himself heavy and oppressed, and this feeling increasing, he was bled the 30th of August—his weight having by this time increased to 85 kilogrammes. During September he suspended the use of the salt, and finding, on resuming it again in October, that his head again became oppressed, he was bled a second time. He made no further experiments on himself during 1843–5, during which period his weight continued at 83 kilogrammes.

Resuming the experiment again November 1st, 1846, he took until the 2d of December 4 or 5 grammes daily, and from the 3d of December 10 grammes—his weight increasing to 85 kilogrammes. The former symptoms of determination to the head coming on, he was bled on the 28th, and the blood analyzed by M. Poggiale. He then resumed his ordinary regimen for 66 days, lost 2 kilogrammes in weight, and feeling quite well, was again bled, in order that his blood might be again analyzed. The two analyses gave the following results:

	First Analysis.	Second Analysis.
Water,	767.60	779.92
Globules,	143.00	130.08
Fibrine,	2.25	2.10
Albumen,	74.00	77.44
Fatty matters,	1.31	1.13
Salts and extractive,	11.84	9.33

In the first analysis 6.10 of chloride of soda, and 1.50 oxide of iron were found, and in the second 4.40 chloride of soda and 1.26 oxide of iron.

On the 4th of June, 1847, he resumed the use of the salt, and by the 22d of August had regained his weight of 85 kilogrammes, and was bled in consequence of giddiness. He omitted it, with loss of weight, until the 20th of September, when he resumed it, and reacquired the weight by the 26th of October. He now left off the salt until January, 1848, and then continued it, with intervals of suspension, until February, 1849, the same results being observed. From March to July he suppressed the use of all salt at his meals, and found as the result a loss of weight and a feeling of debility produced.

M. Plouviez, in an accompanying note, states that he regards salt—1. As a condiment until it enters the stomach. 2. As reacting through its bases upon this viscus, and the intestinal canal. 3. As increasing the quantity of chyle by its action on the elements of the chyme. 4. As an excitant of the intestinal absorbents. 5. As a useful modifier of the blood, by diminishing the proportion of its water. 6. As a principal agent in the solution of albumen and fibrine. 7. As one of the agents tending to produce or increase the globules. 8. As a powerful coadjutor in the act of hematosis, without the aid of which the blood does not become reddened in its contact with oxygen. 9. As a valuable auxiliary in the intimate acts of assimilation and deassimilation.

M. Robinet, in reporting upon the memoir, reserves his opinion of its scientific value, but does not hesitate to compliment the author for his devotion in having thus undergone a saline regimen during 735 days, spread over 25 months of three different years, leading on several occasions to so much indisposition as to call for blood-letting.—*Brit. and For. Med.-Chirurg. Rev.*, Jan., 1850, from *Bulletin de l'Acad. de Méd.*, tom. xiv. pp. 1028, 1077–80.

7. *Contributions to the Chemistry of the Urine.*—Dr. H. Bence Jones, in a valuable paper, under this title, in the *Philosophical Trans.* for 1849, pt. ii., gives the following general conclusions:

I. *On the variations of the acidity of the urine in the state of health.*—When a *mixed* diet was employed, the acidity was found to decrease soon after taking food, and to attain its lowest limit from three to five hours after breakfast and dinner; sooner, however, after breakfast than after dinner. The acidity then gradually increased, and attained its highest limit just before food. If *no* food was taken, the acidity of the urine did not decrease, but remained nearly the same for twelve hours; falling immediately after food was taken. When *animal* food only was taken, the diminution of the acidity after food was more marked and more lasting than when a mixed diet was taken; and the acidity before food rose rather higher with a mixed diet, than it did with animal food. When *vegetable* food only was taken, the contrast with animal food was very marked. The urine did not decrease in acidity to the same degree; though it became neutral, it did not become highly alkaline. The acidity of the urine was rather higher with vegetable food, than it was with animal food; but the increase in the acidity was by no means so marked as the decrease of the alkalescence.

These variations in the acidity of the urine appear to depend on the state of the stomach. When much acid is in the stomach, the acidity of the urine is diminished. When the demand for acid in the stomach has ceased, the acidity of the urine increases. The diurnal variations in the acidity of the urine make it highly probable that corresponding variations occur in the alkalescence of the blood; such diurnal variations being produced by the quantity of acid poured into the stomach for the purpose of dissolving the food. When the food

is irritating, or the stomach in an irritable state, much acid is poured out, and the effects on the blood and urine are more marked than they are when less acid is secreted.

The introduction of dilute sulphuric acid into the stomach, even in large doses, did not produce any very decided change in the acidity of the urine. Nine drachms of dilute acid in three days slightly lessened the decrease in the acidity of the urine *after* taking food, and slightly augmented the acidity *before* taking food. The whole quantity of acid passed in the twenty-four hours was sufficiently augmented to show that the acid does pass off in the urine.

II. *On the simultaneous variations of the amount of uric acid, and the acidity of the urine, in a healthy state.*—There is no relation between the acidity of the urine and the amount of uric acid in it. The urine that was most acid contained least uric acid. That which contained most uric acid was not highly acid. All food causes an increase in the amount of uric acid excreted; but there is no great difference between animal and vegetable food, as regards the amount of increase. No proof was obtained of the influence of exercise in increasing or diminishing the amount of uric acid. From the experiments on the total amount of urine excreted in twenty-four hours, it appears as though the deficiency one day was followed by an excess the following day.

III. *On the deposit of urates in the urine.*—This deposit does not depend solely on the amount of urates present in the urine, relatively to that of the water, but is also influenced by temperature, a low temperature causing a precipitation of that which will remain in solution at a higher temperature; and also by the amount of other acids present in the urine. Alkaline urine will hold in solution a great excess of urate of ammonia, and very feebly acid urine will dissolve much more urate of ammonia than very highly acid urine. But highly acid urine will give no precipitate of urate of ammonia, if only a very small quantity of that substance be present in it. Strong light seems to have some influence. For the deposit sometimes takes place only on the side of the glass exposed to light. Brisk agitation, also, will sometimes hasten, or even cause a deposit of urate of ammonia.

IV. *On the variations of the sulphates in the urine in the healthy state; and on the influence of sulphuric acid, sulphur, and the sulphates, on the amount of the sulphates in the urine.*—The amount of the precipitate of sulphate of baryta is considerably increased soon after food, whether animal or vegetable, but no well-marked difference exists between the two kinds of food, as to their power of producing it. The amount appears to be augmented by exercise; but the increase is not so marked as it is after food. When sulphuric acid is taken in small quantity, even for some time, it exerts no manifest influence on the amount of sulphates in the urine; but when taken in large quantity, the amount of sulphates is perceptibly increased. When dry sulphur was taken, the quantity of sulphates was perceptibly increased, but not to any great amount. The most marked increase was produced by taking sulphate of potash or of magnesia into the stomach; this showed itself in from two to four hours, but was most considerable seven hours after the introduction of the salt.

V. *On the influence of caustic potash, tartaric acid, and tartrate of potash, on the acidity of the urine.*—The use of *liquor potassæ* in large doses lessens the acidity of the urine. One ounce of liq. pot. in three days prevented the acidity of the urine from rising before food to the height it would otherwise have done; but it by no means made the urine constantly alkaline, nor did it hinder the variations produced by the state of the stomach from being very evident. *Tartaric acid* in large doses, increases the acidity of the urine; causing it to rise before food considerably higher than usual, but not preventing the urine passed a few hours after food from being alkaline. *Tartrate of potash*, in large doses, produces the most marked effect on the alkalescence of the urine; 120 grs. of pure dry tartrate of potass, dissolved in ℥iv of distilled water, making the urine alkaline in thirty-five minutes. In two hours the alkalescence had disappeared; but after the next meal, the effect of the tartrate of potash was again apparent.